FIG.1

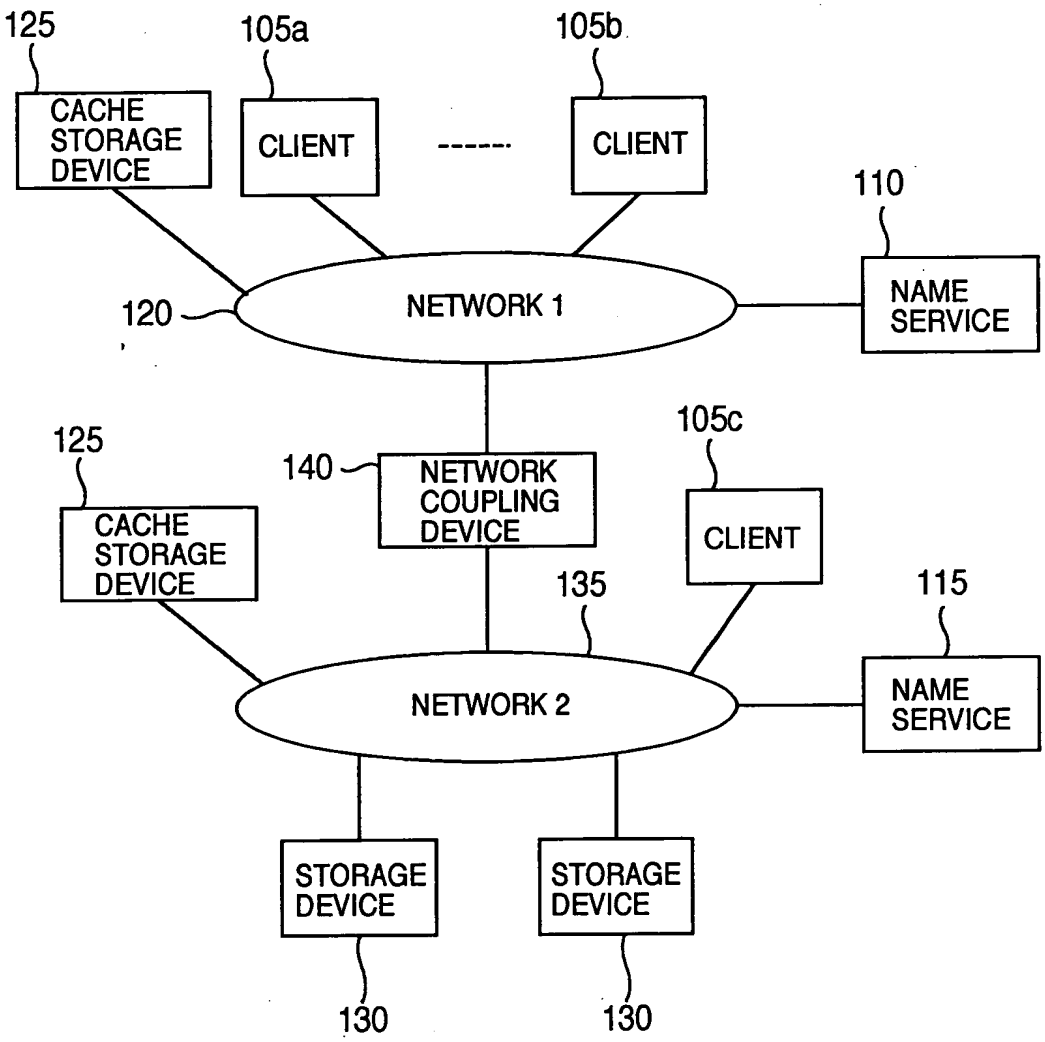

125
105a
105b
CACHE STORAGE DEVICE
CLIENT
CLIENT
110
120
NETWORK 1
NAME SERVICE
125
140
105c
CACHE STORAGE DEVICE
NETWORK COUPLING DEVICE
CLIENT
135
115
NETWORK 2
NAME SERVICE
STORAGE DEVICE
STORAGE DEVICE
130
130

FIG.2

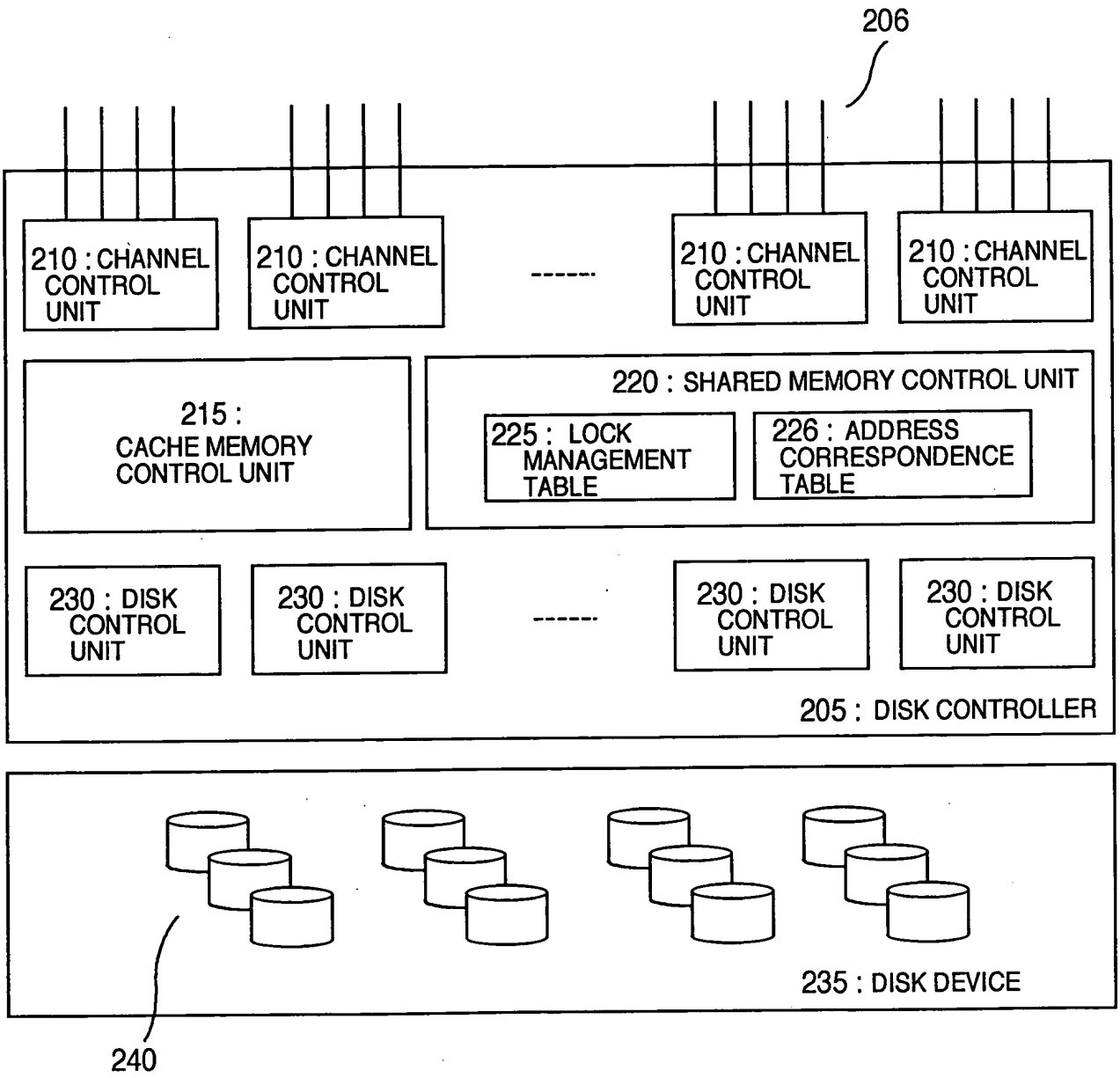

206
210 : CHANNEL CONTROL UNIT
210 : CHANNEL CONTROL UNIT
210 : CHANNEL CONTROL UNIT
210 : CHANNEL CONTROL UNIT
215 : CACHE MEMORY CONTROL UNIT
220 : SHARED MEMORY CONTROL UNIT
225 : LOCK MANAGEMENT TABLE
226 : ADDRESS CORRESPONDENCE TABLE
230 : DISK CONTROL UNIT
230 : DISK CONTROL UNIT
230 : DISK CONTROL UNIT
230 : DISK CONTROL UNIT
205 : DISK CONTROLLER
235 : DISK DEVICE
240

FIG.3

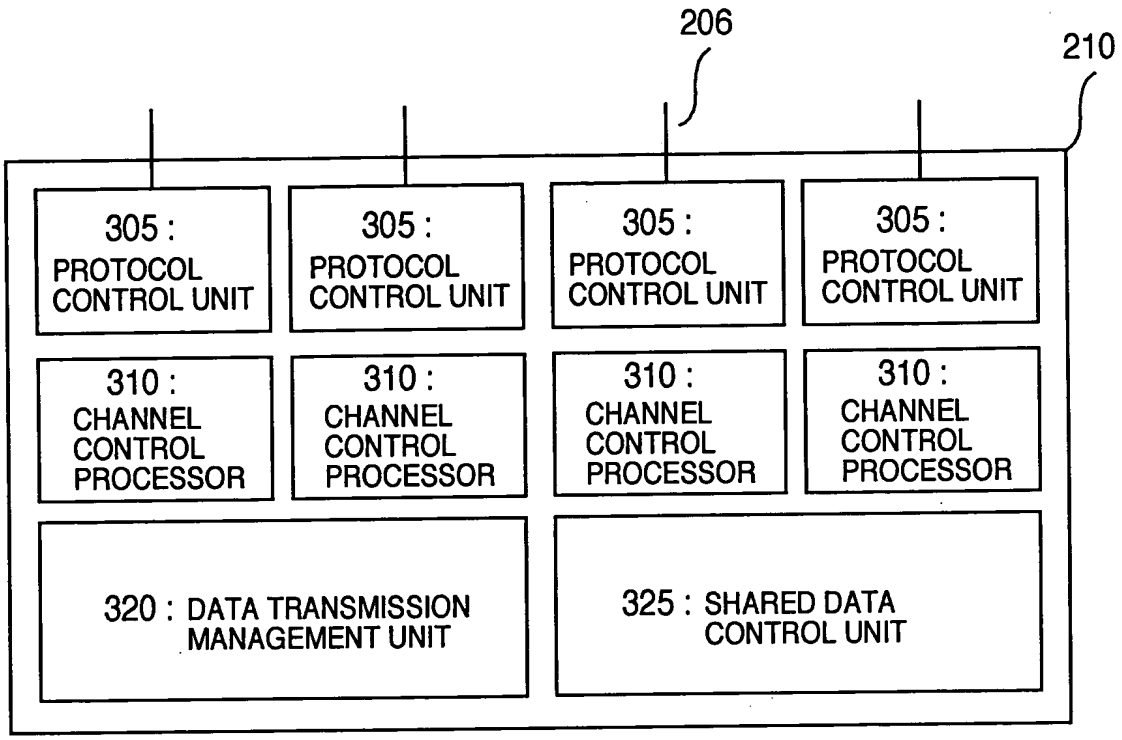

206
210
305 : PROTOCOL CONTROL UNIT
305 : PROTOCOL CONTROL UNIT
305 : PROTOCOL CONTROL UNIT
305 : PROTOCOL CONTROL UNIT
310 : CHANNEL CONTROL PROCESSOR
310 : CHANNEL CONTROL PROCESSOR
310 : CHANNEL CONTROL PROCESSOR
310 : CHANNEL CONTROL PROCESSOR
320 : DATA TRANSMISSION MANAGEMENT UNIT
325 : SHARED DATA CONTROL UNIT

FIG.4

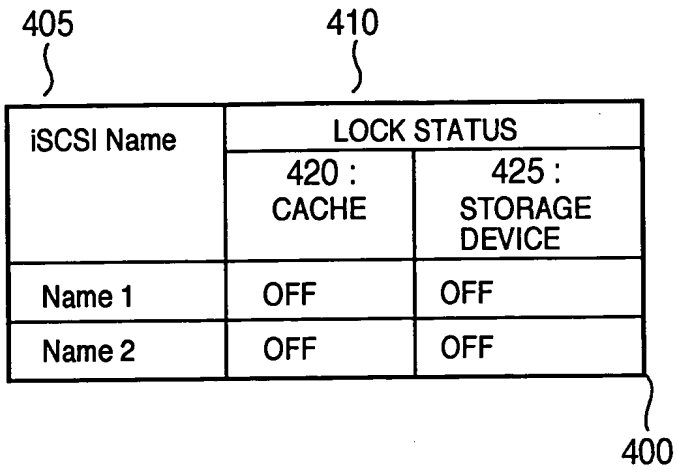

405
410
iSCSI Name
LOCK STATUS
420 : CACHE
425 : STORAGE DEVICE
Name 1
OFF
OFF
Name 2
OFF
OFF
400

FIG.5

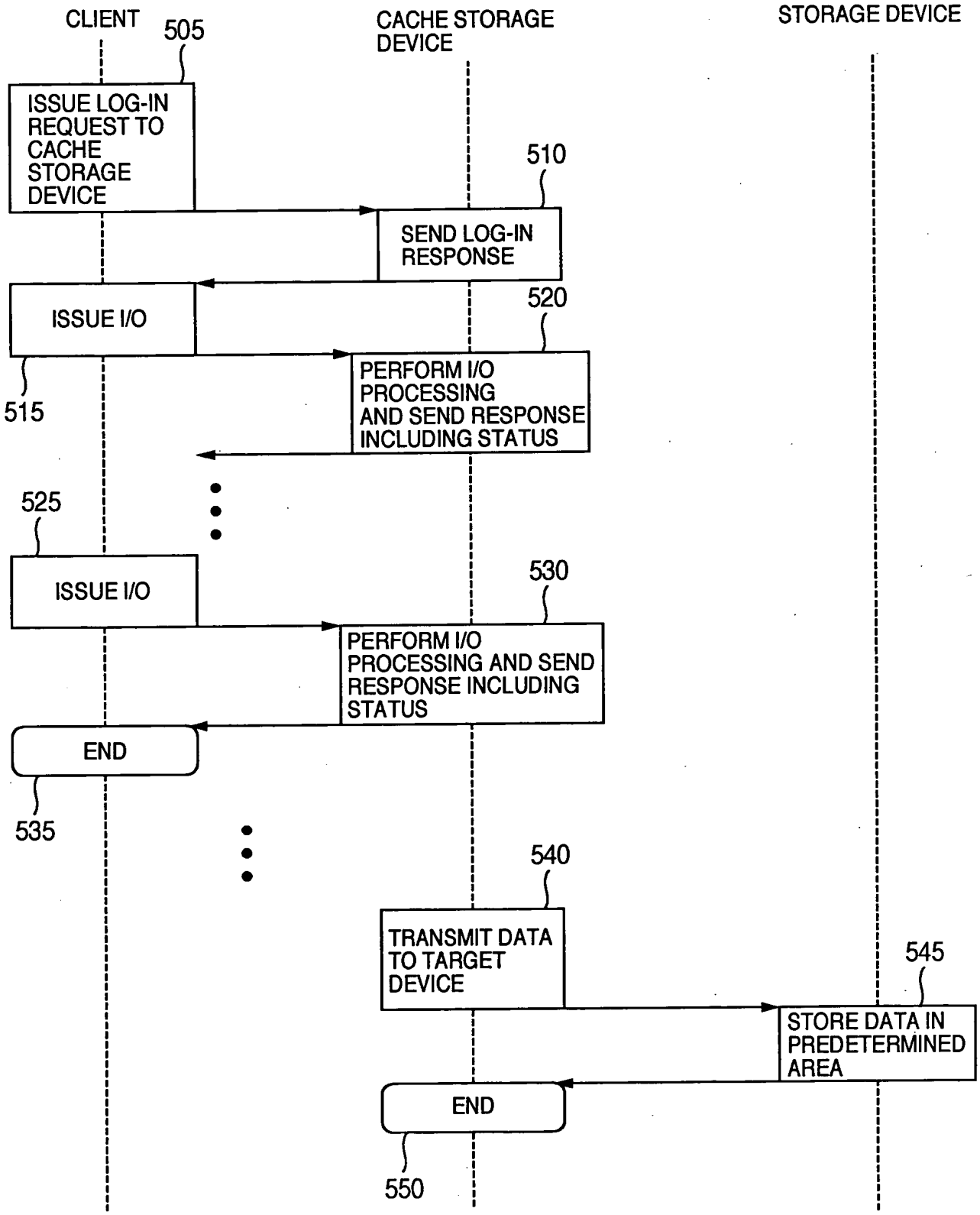

CLIENT
505
CACHE STORAGE DEVICE
STORAGE DEVICE
ISSUE LOG-IN REQUEST TO CACHE STORAGE DEVICE
510
SEND LOG-IN RESPONSE
ISSUE I/O
520
PERFORM I/O PROCESSING AND SEND RESPONSE INCLUDING STATUS
515
525
ISSUE I/O
530
PERFORM I/O PROCESSING AND SEND RESPONSE INCLUDING STATUS
END
535
540
TRANSMIT DATA TO TARGET DEVICE
545
STORE DATA IN PREDETERMINED AREA
END
550

FIG.6

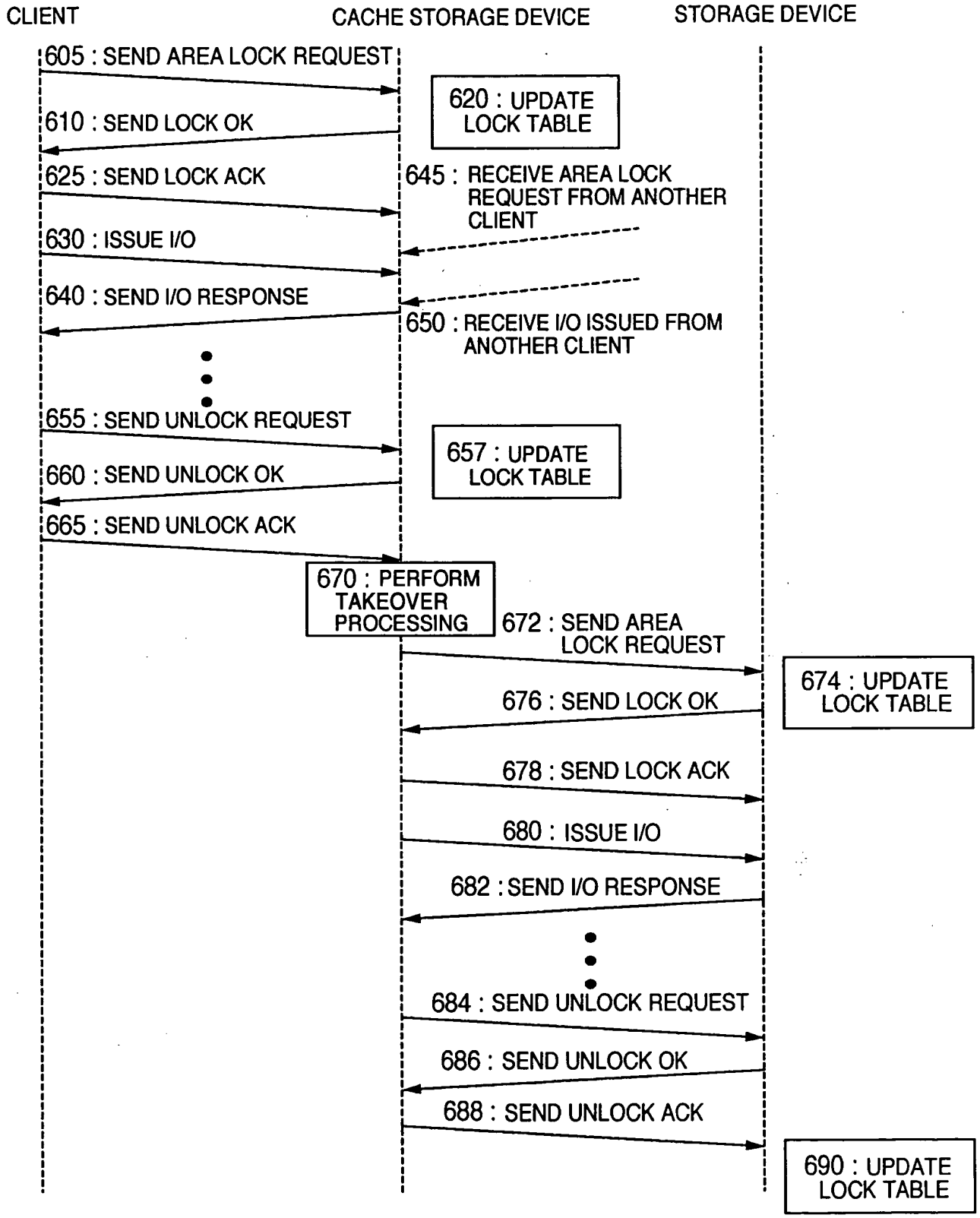

CLIENT
CACHE STORAGE DEVICE
STORAGE DEVICE
605 : SEND AREA LOCK REQUEST
620 : UPDATE LOCK TABLE
610 : SEND LOCK OK
625 : SEND LOCK ACK
645 : RECEIVE AREA LOCK REQUEST FROM ANOTHER CLIENT
630 : ISSUE I/O
640 : SEND I/O RESPONSE
650 : RECEIVE I/O ISSUED FROM ANOTHER CLIENT
655 : SEND UNLOCK REQUEST
657 : UPDATE LOCK TABLE
660 : SEND UNLOCK OK
665 : SEND UNLOCK ACK
670 : PERFORM TAKEOVER PROCESSING
672 : SEND AREA LOCK REQUEST
674 : UPDATE LOCK TABLE
676 : SEND LOCK OK
678 : SEND LOCK ACK
680 : ISSUE I/O
682 : SEND I/O RESPONSE
684 : SEND UNLOCK REQUEST
686 : SEND UNLOCK OK
688 : SEND UNLOCK ACK
690 : UPDATE LOCK TABLE

FIG.7

(1)

Index	iSCSI Name	LOCK STATUS	
		CACHE	STORAGE
dev 1	Name 1	OFF	OFF
dev 2	Name 2	OFF	OFF

(2)

Index	iSCSI Name	LOCK STATUS	
		CACHE	STORAGE
dev 1	Name 1	ON	OFF
dev 2	Name 2	OFF	OFF

(3)

Index	iSCSI Name	LOCK STATUS	
		CACHE	STORAGE
dev 1	Name 1	OFF	OFF
dev 2	Name 2	OFF	OFF

(4)

Index	iSCSI Name	LOCK STATUS	
		CACHE	STORAGE
dev 1	Name 1	OFF	ON
dev 2	Name 2	OFF	OFF

(5)

Index	iSCSI Name	LOCK STATUS	
		CACHE	STORAGE
dev 1	Name 1	OFF	OFF
dev 2	Name 2	OFF	OFF

FIG.8

(1)

Index	iSCSI Name	LOCK STATUS	
		CACHE	STORAGE
dev 1	Name 1	OFF	OFF
dev 2	Name 2	OFF	OFF

(2)

Index	iSCSI Name	LOCK STATUS	
		CACHE	STORAGE
dev 1	Name 1	OFF	ON
dev 2	Name 2	OFF	OFF

(3)

Index	iSCSI Name	LOCK STATUS	
		CACHE	STORAGE
dev 1	Name 1	OFF	OFF
dev 2	Name 2	OFF	OFF

FIG.9

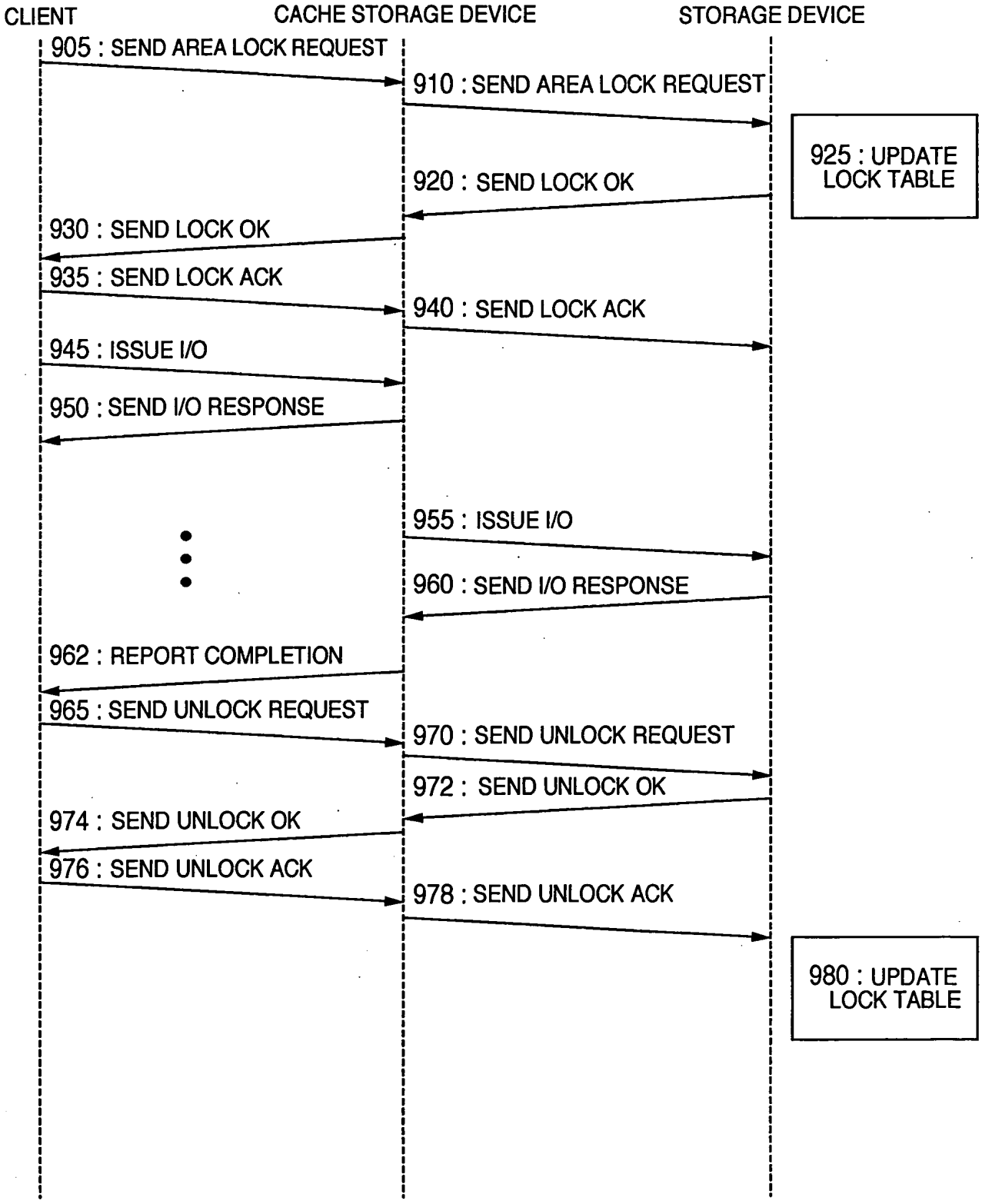

CLIENT
CACHE STORAGE DEVICE
STORAGE DEVICE
905 : SEND AREA LOCK REQUEST
910 : SEND AREA LOCK REQUEST
925 : UPDATE LOCK TABLE
920 : SEND LOCK OK
930 : SEND LOCK OK
935 : SEND LOCK ACK
940 : SEND LOCK ACK
945 : ISSUE I/O
950 : SEND I/O RESPONSE
955 : ISSUE I/O
960 : SEND I/O RESPONSE
962 : REPORT COMPLETION
965 : SEND UNLOCK REQUEST
970 : SEND UNLOCK REQUEST
972 : SEND UNLOCK OK
974 : SEND UNLOCK OK
976 : SEND UNLOCK ACK
978 : SEND UNLOCK ACK
980 : UPDATE LOCK TABLE

FIG.10

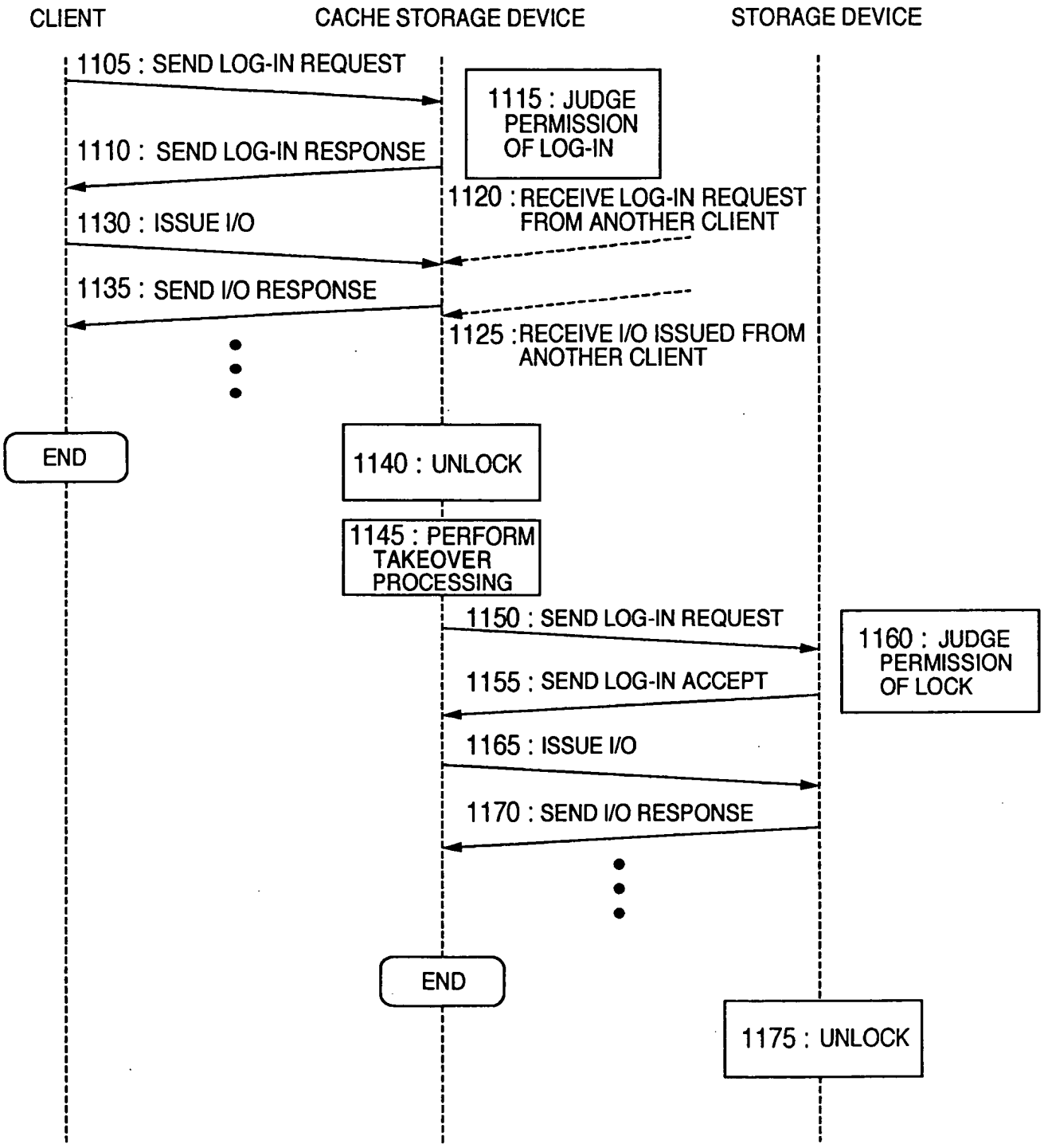

CLIENT
CACHE STORAGE DEVICE
STORAGE DEVICE
1105 : SEND LOG-IN REQUEST
1115 : JUDGE PERMISSION OF LOG-IN
1110 : SEND LOG-IN RESPONSE
1120 : RECEIVE LOG-IN REQUEST FROM ANOTHER CLIENT
1130 : ISSUE I/O
1135 : SEND I/O RESPONSE
1125 : RECEIVE I/O ISSUED FROM ANOTHER CLIENT
END
1140 : UNLOCK
1145 : PERFORM TAKEOVER PROCESSING
1150 : SEND LOG-IN REQUEST
1160 : JUDGE PERMISSION OF LOCK
1155 : SEND LOG-IN ACCEPT
1165 : ISSUE I/O
1170 : SEND I/O RESPONSE
END
1175 : UNLOCK

FIG.11

1305 : DEVICE NAME	1310 : ADDRESS
Dev 1	Name 1
Dev 2	Name 2
Dev 3	Name 3

1300

FIG.12

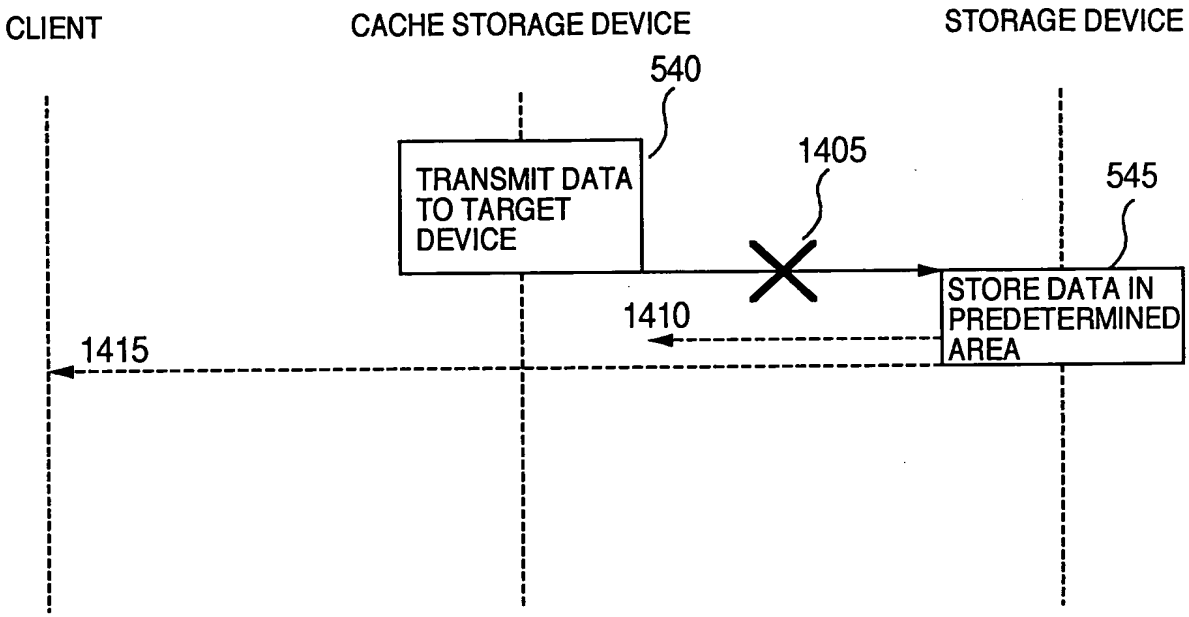

CLIENT
CACHE STORAGE DEVICE
STORAGE DEVICE
540
TRANSMIT DATA TO TARGET DEVICE
1405
545
STORE DATA IN PREDETERMINED AREA
1410
1415

FIG.13

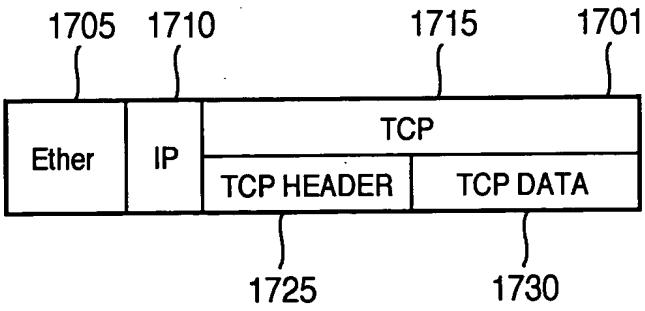

1705
1710
1715
1701
Ether
IP
TCP
TCP HEADER
TCP DATA
1725
1730

FIG.14

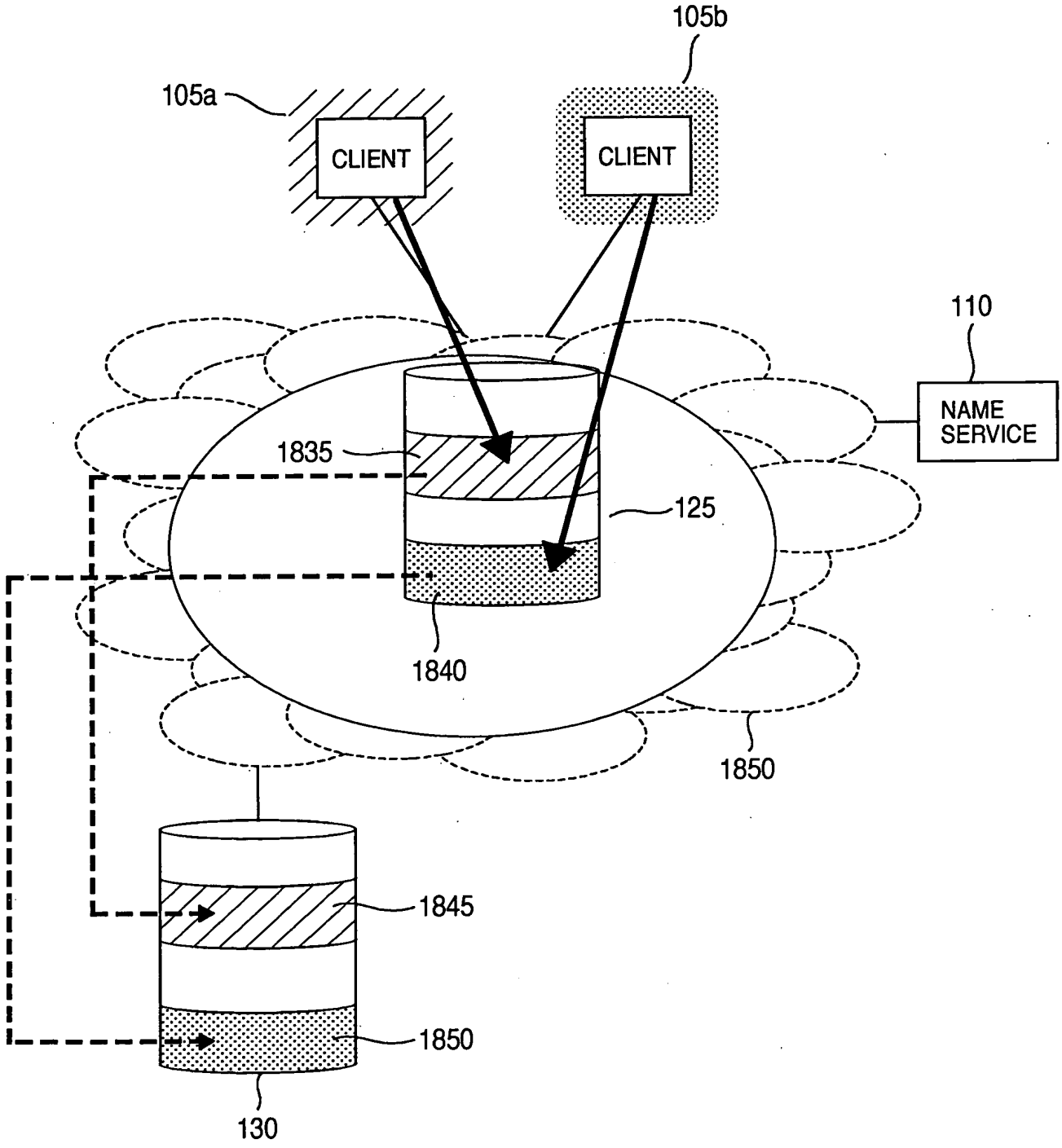

105b
105a
CLIENT
CLIENT
110
NAME SERVICE
1835
125
1840
1850
1845
1850
130

FIG.15

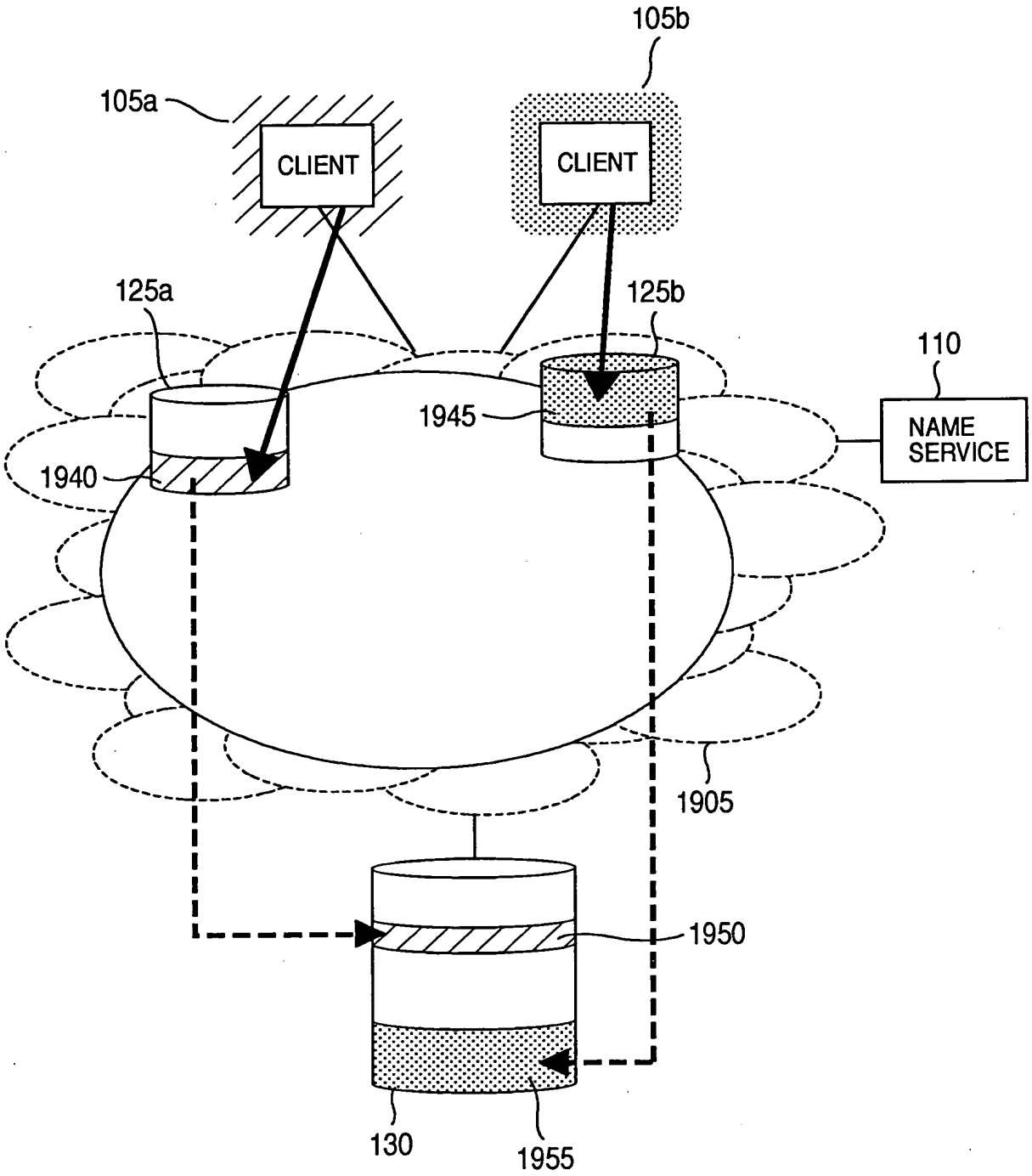

105b
105a
CLIENT
CLIENT
125a
125b
110
1945
NAME SERVICE
1940
1905
1950
130
1955

FIG.16

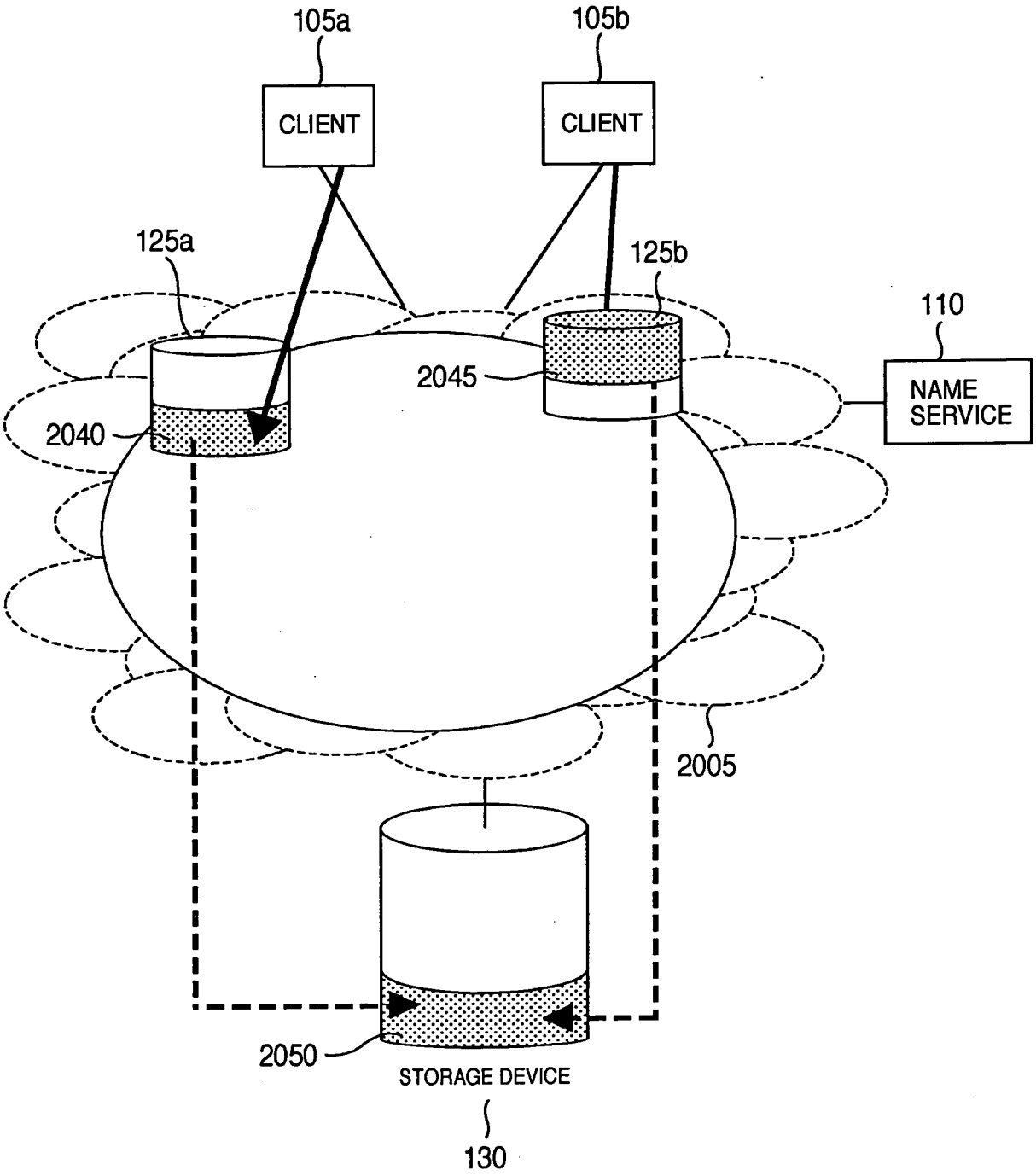
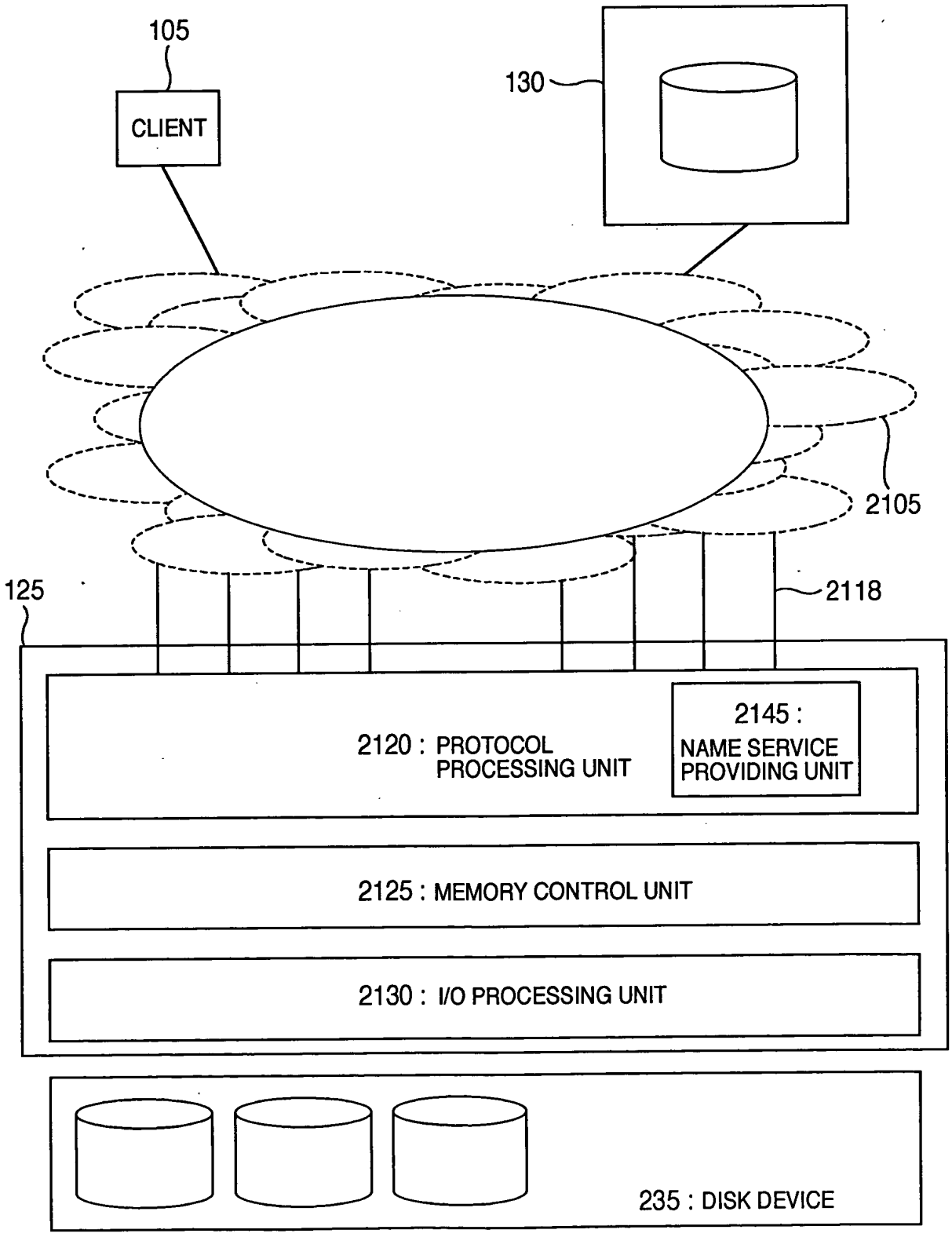

105a
105b
CLIENT
CLIENT
125a
125b
110
2045
NAME SERVICE
2040
2005
2050
STORAGE DEVICE
130

FIG.17


105
CLIENT
130
2105
125
2118
2120 : PROTOCOL PROCESSING UNIT
2145 : NAME SERVICE PROVIDING UNIT
2125 : MEMORY CONTROL UNIT
2130 : I/O PROCESSING UNIT
235 : DISK DEVICE